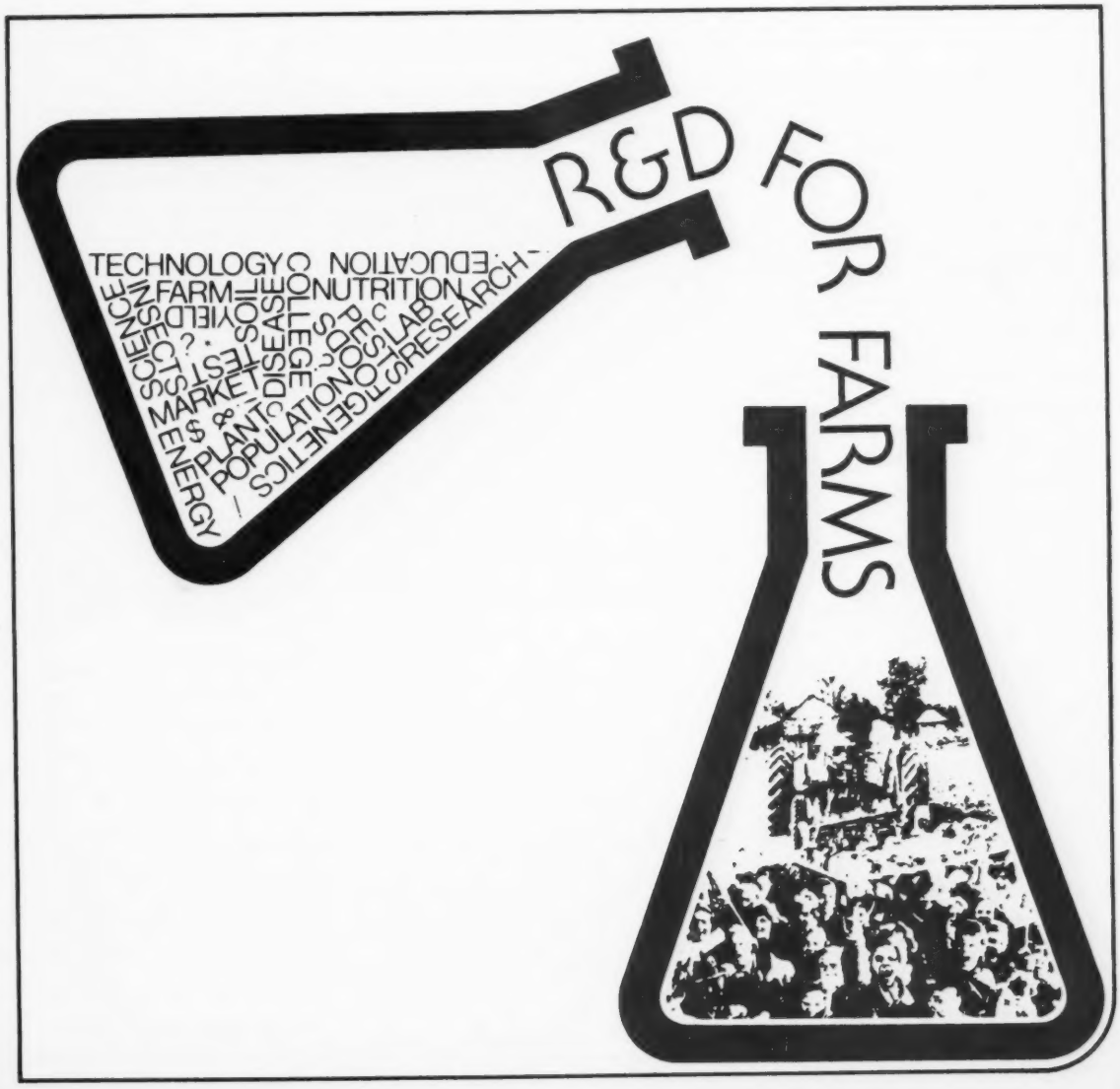
THE FARM INDEX

U.S. Department of Agriculture May 1975



Outlook

Leaping retail food prices are taking a breather this year. ERS expects them to rise only 6-8 percent for all of 1975, with most of the increase already behind us. The last 2 years saw food prices rise by over 14 percent.

Bad weather and poor harvests would upset that projection, however, especially if they dovetail with heavy buying of grains and oilseeds by customers overseas. Under these conditions food prices could average 8-10 percent over 1974. This would set the stage for even steeper increases next year.

The average American is eating a trifle less. Per capita food consumption this year is expected to drift 1 percent below 1974, due mainly to smaller supplies of livestock products. Beef use, the gainer, will be more than offset by pork, poultry, and dairy foods. Crop-related foods will be in greater supply than a year ago but higher prices may put the damper on consumption.

Coffee prices will stay up there through the rest of 1975. Later on is another question. The world's coffee crop for 1975/76 looks to be bigger than the last one, and this suggests declining prices in late 1975. However, price changes on the world market don't show up in the supermarket for 6 to 9 months. The high price of a cup of coffee these days is not being taken lightly by the consumer. Last year we drank the equivalent of 12.8 pounds per person. This year's figure is likely to drip to 12.3 pounds.

The spread between what the farmer gets and the consumer pays will widen again in 1975. Farm-to-retail spreads are expected to average about 10 percent more than last year. Much of the bulge came in the first 3 months. The marketing spread for a basket of farm foods in the first quarter of 1975 was up 18 percent from the same period of 1974.

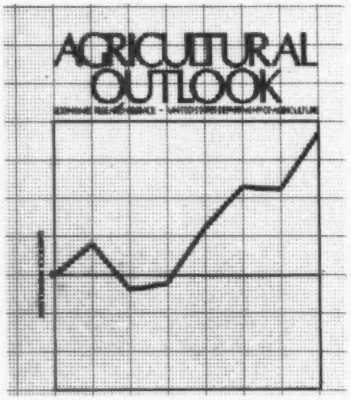
Highlights of the feed grain outlook: shrinking usage . . . sliding prices . . . good chance of record production. Re feed use, livestock and poultry people have been cutting back on feeding in response to high feed prices relative to what they're getting for their products. But assuming normal weather for the 1975 feed crops, those feed prices would edge downward. Good weather would also assure bumper production in the range of 205-229 million tons based on March planting intentions. That compares with 165 million last year and the 1971 record of 208 million tons.

The wheat scene features continued good export demand and a pullback on the domestic side. On balance, though, wheat stocks at the end of the 1974/75 crop year will be even skimpier than last year's relatively small carryover. The scene could change in 1975/76 as indicated wheat acreage for 1975 is up to the highest level since 1953.

Farmers shopping for supplies are finding the shelves well stocked, compared to last year, at least. Price tags, on the other hand, have not come down. Expect spot shortages of LP gas, although gasoline and diesel fuel should prove adequate. Fertilizer supplies are improved over last year. You can also get small machinery items without much trouble. For the big items, you should expect some delays on delivery.

Weather permitting, cattle marketings in the summer and fall will continue heavy and prices will slip a bit. But there's always the possibility cattle prices will point upward if producers decide to hold back more cattle from slaughter and feed them longer as a result of drops in feed prices. This could happen also: another dry summer and poor feed crop would trigger some liquidation in the herd and depress prices of all classes of cattle.

It's now certain that net farm income will sink in 1975. The last prognosis issued in May put the figure



Latest Edition

The welcome mat goes out to *Agricultural Outlook*, a new ERS periodical scheduled to hit the stands in late June.

Initially, *AO* will consolidate the information now carried in *Demand and Price Situation*, *Farm Income Situation*, and *Agricultural Outlook Digest*. Portions of *Marketing and Transportation Situation* will be merged in the new report sometime in August.

AO will come out monthly, except for the combined January-February issue. It will have some 30 pages featuring latest analyses of the general and agricultural economies, plus digests and updates of developments in commodities, production, and trade. The split between outlook and situation information will stay about the same as in the reports to be discontinued, though outlook items will get special emphasis.

The merger of existing reports was recommended by a USDA task force, which has been reviewing the outlook and situation publishing program for the past year. The task force saw a need for a publication that would provide more timely forecasts.

Also beginning in June, The Farm Index Outlook section will look a little different. It will be shorter on details but longer on scope to give our readers a bird's-eye glimpse of what lies ahead for farmers, agribusinessmen, and consumers. Readers interested in the nitty-gritty are invited to subscribe to the new *Agricultural Outlook*. For a free sample copy, write The Farm Index, Rm. 1664, Dept. of Agriculture, Wash. D.C., 20250.

at around $20 billion, quite a slump from 1974's $27.2 billion. Rising production costs will absorb any gain in gross income. ERS bases its forecast on indicated planting intentions and the assumption of good weather.

The twine bind is loosening. The good news is farmers will have more twine and wire than last year to tie up the 1975 hay crop, thanks to stepped up imports of natural fiber twine and bigger domestic output of synthetic types. Both wire and twine prices have started to soften, twine especially.

Up in value, down in volume. That's the latest word on U.S. farm exports for the fiscal year ending June 30. Value is slated to hit about $22 billion, a shade higher than fiscal 1974, with all the gain stemming from better prices. Ton-for-ton, shipments will be off by an estimated 15 percent. Our agricultural imports will drop to under $10 billion, leaving a favorable trade balance of around $12 billion versus $11.8 billion for fiscal 1974.

Supplies of processed vegetables look more than ample the balance of this season. Processors handling eight major vegetable crops expect to contract for 3 percent more acreage in 1975. "The big eight" account for about nine-tenths of all processed vegetable tonnage. Given average yields, as much as 5 percent more vegetables should be available for processing. A larger canned pack is is the offing, though freezers might cut back slightly to avoid a supply glut in 1975/76.

Don't apologize for stocking up on fruit—there's plenty to go around. Supplies for the rest of the 1974/75 season will be substantially greater than a year ago. The citrus crop is a record, and stocks of most processed products are sufficient to meet market needs. Cold storage holdings of most fresh deciduous fruits are adequate also.

Contents

Features

The Myth of the All-American Farm 4
More and more of our agricultural land is being snapped up by foreign investors and corporations. Just what does American law say about such investments?

R & D for Farms 7
Farmers welcome new technologies as fast as the laboratories can produce them, says this article, fourth in a series commemorating the Bicentennial.

Wheat: R & D Case Study 9
You can thank the Mennonites, Mark Carleton, and the genius of researchers for the bread on your table.

From Plowshares to Computers 12
A brief look at the growth in farming know-how, from the early "cow colleges" to modern computer banks.

Fueling Up for Farming 14
Overall fuel demand for crop production will fall slightly over the next decade, but efficiency looks like the key word for farming's fuel needs.

Crackdown on Nut Use Stirs Industry 17
Spurred by cutbacks on nuts in baked goods, the tree nut industry is revving up to attract new markets.

Departments

Outlook 2

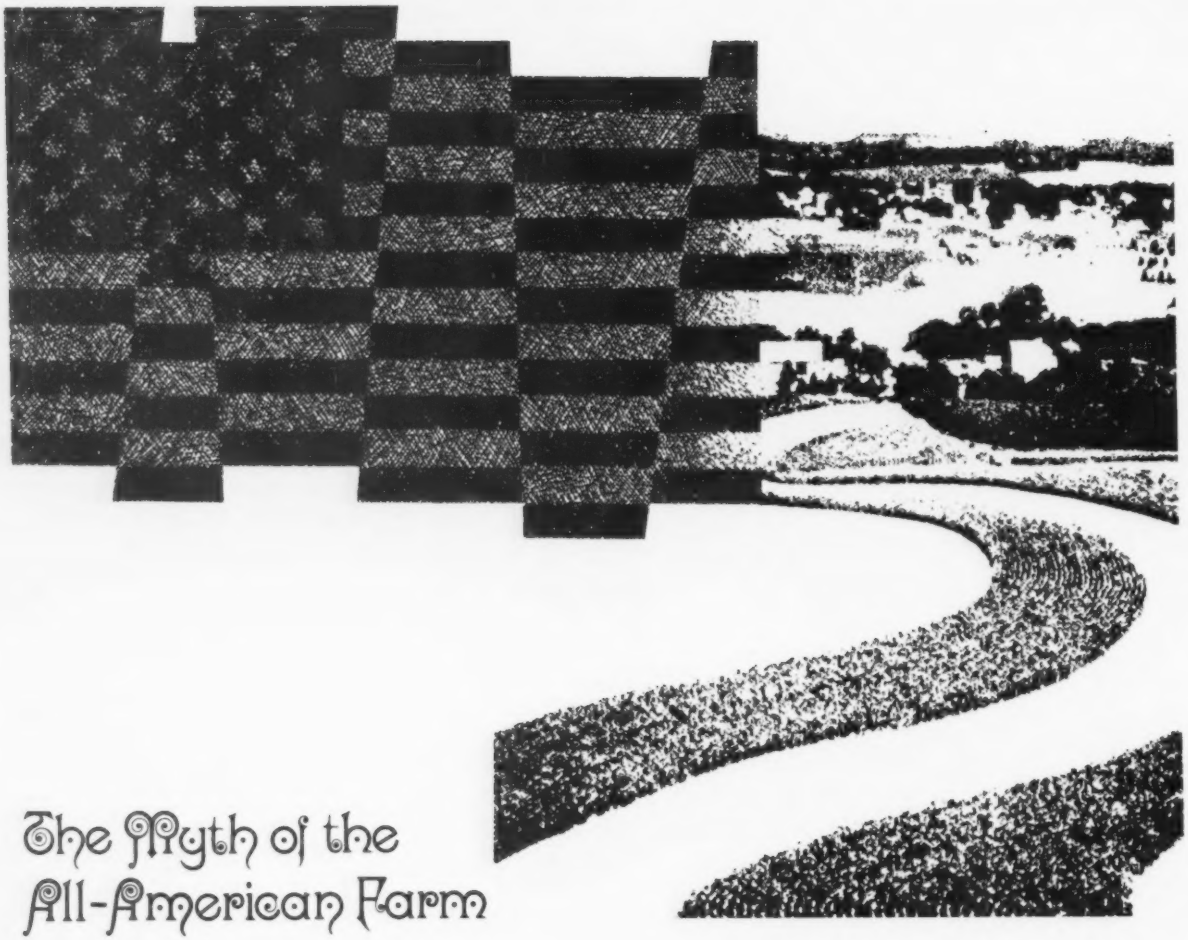
Recent Publications 22

Economic Trends 23

Martin Schubkegel, Editor
Virginia Broadbeck, Dorothy Mayes, Martha Newton, Staff Editors;
James Schleyer, Art Director.

The Farm Index is published monthly by the Economic Research Service, U.S. Department of Agriculture. May 1975. Vol. XIV. No. 5.
Readers are invited to write for the research materials on which we base our articles. Address queries to The Farm Index, Rm. 1664, Economic Research Service, U.S. Department of Agriculture, Wash., D.C. 20250. Please cite article titles when ordering.

Contents of this magazine may be reprinted without permission. They are based on research of the Economic Research Service and on studies done in cooperation with State agricultural experiment stations. The Secretary of Agriculture has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this publication approved by Director of the Office of Management and Budget through May 24, 1977. Subscription price $7.70 yearly ($9.65 foreign). Single copies 70 cents. Order from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Use of commercial and trade names does not imply approval or constitute endorsement by USDA or the Economic Research Service.



The Myth of the All-American Farm

Someone's speaking a strange language at that place for sale just across the fence from you. A visitor from abroad? Maybe. But he may well be the new owner.

Why the apparent increased interest in farmland? For one thing, the worldwide food shortage may have encouraged foreigners to invest in U.S. food and fiber industries. For another, the 1973 oil embargo, and the resulting high oil prices, put vast sums of investment money in the hands of the oil exporting nations.

The quickening interest in U.S. agriculture has raised questions about what American law permits by way of foreign investments. A number of bills on this issue have been considered by Congress and State legislatures. One bill—the Foreign Investment Study Act of 1974—was passed by Congress last year.

To answer some of the questions about foreign investments, an ERS economist and a law professor from the University of Minnesota studied State and Federal laws on alien and corporate investment in rural land. Their aim was to identify existing systems of regulation and to examine their practical and legal effectiveness. For purposes of the study, "alien" referred to anyone who is not a U.S. citizen.

Anti-alien States. The authors found that 29 States have restrictions against alien ownership of land. Among them are Connecticut, Indiana, Kentucky, Mississippi, Nebraska, New Hampshire, and Oklahoma—States which have a general prohibition against alien investment.

Although this is the most comprehensive type of State restriction, its effects are limited mainly to keeping the nonresident alien from investing in our agricultural land. Aliens living in this country are generally excluded.

Another type of restriction—one that severely limits alien investment—deals with acreage and time limitations.

Iowa, Minnesota, Pennsylvania, and Wisconsin limit the acreage a nonresident alien can own—commonly between 160 and 640 acres. Such limitations prevent any major and concentrated foreign investment,

since one person may not do a good job of managing a large number of small holdings.

Illinois puts a time limit of 6 years on alien land holdings. This number was probably chosen to permit the alien who has inherited land time to dispose of it, and also to permit an immigrant time to become a citizen.

An effective barrier? Time limits may serve as a barrier to alien investment, since aliens may be limited to leasing land and may not benefit from long-term gains in property values. On the other hand, time limits may not be a complete barrier, since it would be possible for the investor to continuously lease new land.

Eight States—Arizona, Hawaii, Georgia, Maryland, New Jersey, South Carolina, Virginia, and Wyoming—have minor restrictions which are of little importance, as none would be a major impediment to alien investors.

These restrictions range from a requirement that aliens be "friends" of the U.S. to one that demands that the alien be "eligible for citizenship." Since there are Federal regulations that preclude any State restrictions in the case of military hostilities, and the naturalization laws no longer exclude any group from citizenship, these restrictions don't carry much weight.

Additional restrictions. In addition to these three categories of State limitations—general prohibition, acreage and time limitations, and minor restrictions—there are other regulations regarding State property, inheritance rights, and alien corporate investment.

Alaska, Arizona, Hawaii, Idaho, and Oregon limit the right to purchase State property or establish mining claims on State property to citizens and aliens seeking citizenship.

A restriction based on reciprocity. Fourteen States have restrictions on alien inheritance rights. In some cases the right of a foreign heir to inherit land is based on reciprocity—the alien can inherit in the U.S. only if an American can inherit in the foreign nation.

Limitations on inheritance rights may serve as a substantial barrier to individual foreign investment since an alien investor would not relish the forfeiture or forced sale of his assets upon death.

Seven States—Arizona, Iowa, Minnesota, Nebraska, New York, South Carolina, and Wisconsin—restrict alien corporate investment in real estate.

Some limit land ownership by corporations chartered outside the U.S. This is probably the least effective restriction, since the alien corporation may simply form a subsidiary somewhere within the country.

Others exclude corporations with more than a specified percentage of alien owners, directors, or managers. These laws focus on the actual nationality of the investors, not the nominal nationality of the corporation itself. While this type of restriction may work in some cases, the establishment of intermediate corporate holding companies or nominees may make it difficult to discern the true identity of the owners.

With all these stumbling blocks it would seem as though the foreign investor would have a hard time grabbing land in the anti-alien States which have substantial restrictions. Due to a number of Constitutional and Federal limitations, however, this is not necessarily true.

Equal protection. The most comprehensive restriction on State power is contained in the Equal Protection Clause of the Fourteenth Amendment: ". . . nor shall any state . . . deny to any person within its jurisdiction the equal protection of the laws."

The important feature of the constitutional language is that it applies to any person within the State's jurisdiction, both alien and citizen alike. Recent case law has been uniform in indicating that resident aliens are protected, but it has not totally clarified the position of the nonresident alien.

The second major constitutional limitation to State restrictions is that the Federal Government has complete power over foreign relations. This means that if State laws interfere with the Federal Government's relations with foreign nations, those laws become invalid. Federal laws, such as the Foreign Assets Control Regulations, and treaties, also take precedence over any conflicting State law.

In the opinion of the law professor, the present regulations in most States are of little practical value and will remain that way until there are parallel controls on foreign investments through corporations, partnerships, and trusts.

Federal restrictions. What about Federal laws or regulations limiting alien land ownership? Since the law of property is State law, there have been few Federal laws. However, the Federal codes which do exist fall into two categories.

The first controls the assets of aliens the Government considers "enemy" or "hostile." For example, in time of war or declared emergency, the Office of Alien Property in the Department of Justice controls the assets of "enemy" aliens. In a similar manner, the Foreign Assets Control Regulations limit the use of property by citizens of certain "hostile" nations. Under these regulations, the alien retains his property,

Foreigners and Farmland

Exactly how much farmland belongs to aliens? Right now, your guess is about as good as ours. Until a few years ago, foreign investments in U.S. agriculture were so low key that no one was interested in finding out. Then all of a sudden, significant interest was being shown by certain countries, bringing into focus the whole question of what our laws permit by way of foreign investment in real estate. The Foreign Investment Study Act of 1974 authorized the Departments of Commerce and Treasury to study the issue of alien investment in farmland, along with other areas. So far, there are no pat answers, but officials hope to come up with first estimates within the next 18 months.

but is forbidden to transact any business with it, and others are forbidden to deal with him. In practical terms, his assets are blocked. Transactions involving his property require special licenses from the Department of the Treasury.

Countries affected. At present, only five countries—North Vietnam, North Korea, the Peoples Republic of China, Cambodia, and South Vietnam—are subject to such controls. Two other countries—Cuba and Rhodesia—are affected under parallel regulations.

Because the consequences of putting a nation on the blocked list are so serious—loss of investment, banking, and trade—the U.S. only uses this measure under extreme conditions.

The second type of Federal law restricting alien land ownership deals with disposition of the public domain. Under the Taylor Grazing Act, Federal grazing permits may be given to citizens, aliens who are in the process of becoming citizens, and to certain groups, associations, and corporations. The Bureau of Land Management of The Department of the Interior has required that U.S. citizens have the controlling interest.

For citizens only. USDA's Forest Service has similarly restricted grazing permits on forest land. Under current regulations, aliens cannot hold such permits. Even resident aliens are excluded, until they receive final citizenship papers.

Public lands containing mineral deposits are up for grabs for both citizens and aliens who have stated their intentions to become citizens. Under the Mineral Leasing Act, which applies to the development of coal, oil, oil shale, and a few other minerals, private investors are confined to leasing, rather than purchasing, the mineral rights.

Turning to the question of corporate investment in farmland, we discover that 6 States in the Upper Midwest and Great Plains—Wisconsin, Minnesota, North Dakota, South Dakota, Kansas, and Oklahoma—have laws which substantially restrict this type of ownership. These laws generally apply equally to nonresident aliens, alien corporations, and U.S. investors.

Discrimination only against big agribusiness. The major impact of corporate farming laws is to keep major agribusinesses and conglomerates from obtaining farmland. The individual investor is generally free from such restrictions. This can be seen by the exceptions each State makes toward certain types of corporations.

First are "family farm corporations" in which all, or a majority, of the stockholders are relatives, and in which at least one of them actually lives on the land and farms it.

The other kind of exception permits "qualified farm corporations." These have a limited number of stockholders—usually no more than 10—whose principal business is farming. These corporations may engage in farming directly, or by leasing land to other farmers.

Each of the State statutes reflects local interests and agricultural activities. For example, in Minnesota, a nonexempt corporation may raise wild rice but not beef cattle.

The constitutional limitations that apply to alien investment in farmland also apply to corporations. But since the issue of corporate investment deals with economic rights, and not basic human rights, the Supreme Court has been much more willing to accept State legislative judgments.

[Based on *State and Federal Legal Regulation of Alien and Corporate Land Ownership and Farm Operation*, AER 284, by Fred L. Morrison, Professor of Law, University of Minnesota, and Kenneth R. Krause, National Economic Analysis Division.]

Staking Out America's Heartlands

Owning a piece of land is an American tradition. Nearly three-fifths of our total land area is privately owned. The biggest part—over 1 billion acres out of a total 2.3 billion—is in agricultural use. Practically all of the cropland and most of the grazing land belongs to private owners.

Forests account for about 750 million acres, with well over half in private ownership, particularly in the East. Nearly 9 out of every 10 acres of forestland east of the Great Plains are privately owned, with about 4 out of 10 acres held by owners who are not using the land for either farms or commercial forests. In the past 2 decades these owners have increased their holdings by 40 percent, largely at the expense of forest farms, and represent a trend toward ownership of woodlands for recreation or other purposes.

The remainder of the Nation's land, both privately and publicly held, is in cities, mountains, deserts, wildlife preserves, and public facilities.

Although the bulk of U.S. acreage is farmland, there are only about 4 million farmland owners. Of these, about 1.4 million are nonoperator landlords, who own but don't actually farm the land. This type of owner is common in States like Illinois, where rentals account for over half the acreage and nearly three-fifths the market value of farmland and buildings.

In 1969, the latest year for which there are Census statistics, there were 2.7 million farm operators, of whom 2.4 million owned at least some of the land they farmed—722 million acres in all. Nearly 1 million operators were noncommercial (part-timers, semi-retired folks, hobby farmers, etc.) with annual sales of less than $2,500.

Although noncommercial farms contribute little to total U.S. production—only 2 percent of all farm sales—they do represent a substantial number of people and resources that might be marshaled to increase food production if need be.

About half the land in farms is operated by part-owners, while another third is operated by full-owners. Thirteen percent is operated by tenants.

[Based on speech by Robert F. Boxley, Natural Resource Economics Division, entitled "Land Ownership in the U.S.," given at 1975 Rural Policy Forum, University of Illinois, March 4, 1975.]

Alexis de Tocqueville, the famous Frenchman who traveled widely in America in the first half of the 1800's, had a great batting average for telling it like it was.

But as the U.S. goes, he missed the mark when he said "Agriculture is perhaps, of all the useful arts, that which improves most slowly among democratic nations."

In his day farmers tilled their crops and cared for their livestock in traditional ways. Although there were signs of change—the inventions of the moldboard plow, the cotton gin, and the reaper, for example—farmers still were slower to change than businessmen or industrialists of that period.

Hard to predict. We can forgive de Tocqueville for his lack of foresight regarding this one area. Indeed, few could have detected in the agriculture of the mid-1800's the sparks of the technological explosion that would revolutionize farming 100 years later.

Perhaps the greatest change is in the minds of farmers themselves, who eagerly seize and apply new technologies as fast as they leave the laboratories: new varieties, new fertilizers, new pesticides and herbicides, new systems of cultivation, new management techniques.

They welcome with equal enthusiasm new research findings concerning new uses for farm products, more efficient marketing and distribution, and improved technologies in transportation, storage, and processing.

This change didn't just happen. It was the direct payoff from a unique and massive effort over a 100-year period that created a vast network of agricultural research and educational institutions.

Among farmers' contact points for research information are the county extension offices in nearly all 3,044 counties in the 50 States, Puerto Rico, Guam, and the District of Columbia. Each is staffed with one or more full-time professional agriculturists and home economists. The 11,500 county workers are backstopped by 4,500 State extension professionals. A small Federal office in USDA services and coordinates the State offices.

Extension helpers. In recent years, the Extension Services have employed a growing number of paraprofessionals who help disseminate information on nutrition, health, and family living to poor people in rural and urban areas. In addition, the

services use a legion of unpaid, trained, volunteer local leaders.

Research information also reaches farmers and the public through the press, radio, and television. Advertising is another means by which agribusiness firms communicate with farmers and others. Supplier firms themselves are also important distributors of new knowledge.

Research findings flow into this information network from a variety of sources.

First in research. Largest of the public research agencies is USDA's Agricultural Research Service (ARS). It operates 127 separate research establishments, including the Agricultural Research Center at Beltsville, Md., and laboratories in each of the States, Puerto Rico, the Virgin Islands, and several foreign countries. ARS also conducts research in cooperation with, or under contracts or grants with, State agricultural experiment stations, State departments of agriculture, and other groups both public and private.

Other USDA research agencies include the Economic Research Service, the Forest Service, and the Farmer Cooperative Service. Statistics on agricultural production and other subjects are collected by the Statistical Reporting Service.

Professional workers engaged in publicly financed agricultural research total about 18,500 man-years.

Private network. Data are not available on private agricultural research but it is believed to be roughly equivalent to that conducted by public agencies. Research staffs are maintained by practically all large manufacturers of feed, seed, fertilizer, pesticides, and farm machinery, and by firms engaged in transportation, processing, packaging, and merchandising of agricultural products.

Most of the technical and scientific people involved with this research and extension network were trained in the American system of publicly supported colleges and universities. None of these, of course, are exclusively agricultural schools. Only about 7 percent of the nearly 1 million students in these universities are enrolled in agricultural majors.

Birth of USDA. The first major step in the development of the agricultural research and education network was the establishment of the United States Department of Agriculture in 1862.

At first the name was more impressive than the fact. The new Department consisted of a Commissioner, a superintendent of gardens, a chemist, entomologist, statistician, and several clerks. Its offices were in the basement of the Patent Office Building. The first experimental garden was several acres on what is now the Mall in downtown Washington, D.C.

The year that the Congress established USDA, it also granted each State a patrimony from the public lands. Proceeds from the sale of this land were to be used to establish agricultural and mechanical (A&M) colleges.

Humble beginning. The land grant colleges started small. In most cases, a farm was purchased and a single brick building was erected to provide classroom, laboratory, office, and dormitory space.

Farmers and State politicians didn't see the value of the A & M colleges right away, though State legislatures provided funds for buildings and sometimes for maintenance. For the first 30 years, the colleges had to rely primarily on the income from Federal endowments.

Then in 1887, the Hatch Act set an annual stipend of $15,000 to support experiment stations at the colleges. The Second Morrill Act of 1890 provided further increases to an annual additional total of $25,000 per school. Federal support for the experiment stations increased further during the first part of the 20th century, reaching $90,000 per State by 1929. State support rose even more rapidly.

From famine to feast. The fortunes of the colleges swelled rapidly with the rise in farm prices during the first 2 decades of the 20th century. Funds provided by State legislatures increased and enrollment soared. For the first time, there were enough students to make up classes in agricultural subjects. By 1910, the colleges were overcrowded, and some classes were held in stables.

The long gestation period gave the colleges time to learn some basic lessons. They found that publicly supported research must solve the problems of its constituents and that the solutions must be communicated to the public in usable form. They learned what the problems were. They also learned the value of systematizing all available knowledge on a subject before they broke new ground.

The experiment stations and the USDA also had to define and refine scientific method, acquire equipment, and develop terminology so that research could be verified and communicated to other scientists.

Laying the groundwork. The period from 1900 to 1930 saw two major developments that laid the groundwork for agricultural research and education as we know it today.

- Training of research scientists and technologists in fields relating to agriculture, including research in the social sciences which began before World War I.
- Training of communicators who could interpret and pass the know-how from the laboratory to the working farmer.

Public financing of communication was inaugurated by the Smith-Lever Act of 1914, which gave financial support for a nationwide system of adult education in agriculture and home economics. The Smith-Hughes Act of 1917 provided Federal money for vocational education.

Production revolution. Many of the more elementary scientific production problems of agriculture were solved during the first third of this century. More important for the long run, the research that produced the revolution in productivity after World War II was launched. It was to supply basic knowledge in genetics, human, animal and plant nutrition, and plant and animal diseases and pests.

The Extension Service campaigned to eliminate the diseases and pests that caused great losses to farmers. A campaign to eradicate barberries,

(*Continued on page 10*)

Wheat: R&D Case Study

In 1873, a group of Russian Mennonites immigrated to western Kansas, bringing with them wheat from their homeland in the Crimea. Although the "turkey" wheat prospered in Kansas and provided food and feed for the settlers, there was no market for it. Americans demanded light, white bread which could only be made from the soft wheats which grew in the East and Midwest.

The problem of the hard wheat challenged American millers. They discovered a mill which had been developed in eastern Europe, and used principally for processing sugar cane and manufacturing sheet metal. The mill had rollers which proved superior to flat millstones for grinding the hard wheats because they could be adjusted to crack off the bran without breaking up the inner starchy kernel. Successive grindings and siftings could then reduce the kernel into high grade flour.

This discovery set off a feverish period of experimentation. Hundreds of patents were issued for mechanical purifiers, sifters, cleaners, dust collectors, and other milling equipment. One of these, the "middlings purifier," greatly facilitated the separating of the bran particles and increased the yield of high grade flour from a bushel of wheat. By 1881 the mills of Minneapolis, Kansas City, and St. Louis were ready to process a large volume of the hard wheat into bread flour by the new process.

As wheat acreage in the Great Plains increased, new problems arose—plant lice, saw flies, chinch bugs, grasshoppers, army worms, mosaic virus, smut, and worst of all, rust.

Research on wheat enemies was one of the earliest projects of the experiment stations of the Great Plains area. Researchers found that the genetic base of their wheats was too narrow. Mark Carleton, a wheat breeder at the Kansas State Experiment Station, was sent by the USDA to Russia in 1900. He brought back about 1,000 varieties of wheat.

With these resources and a new understanding of genetics, wheat breeding began in earnest in the experiment stations and in the USDA. Desirable characteristics—such as disease, cold, drought, and lodging resistance—were bred into new varieties. Milling quality was improved. New methods of tillage and seeding were developed, and yields were increased.

But the research is far from being finished. The laws of survival of the fittest also apply to insect pests and disease microorganisms. They continually produce mutations that can survive and thrive on plants believed to be resistant to their species. If not detected early and stopped by newly developed resistant plants, they soon become epidemic. Most of the commercial wheat varieties in use today have been developed in the past 10 years.

Left: Russian immigrants brought their native hard wheat from the Crimea to America in the 1870's.

Today's improved U.S. wheats owe a debt to Mark Carleton's research.

Wheat breeding in many areas is now geared to boosting protein.

Transferring pollen is the first step in developing a new variety.

an intermediate host of wheat rust, was conducted during World War I—followed by successful efforts against bovine tuberculosis, Bangs disease, avian pullorum, hog cholera, and several others.

"Cow colleges." Despite their contributions, the land grant colleges, and especially the agricultural divisions, were slow to gain recognition as institutions of higher learning. Agriculture students sometimes were ridiculed as "hayseeds" who attended "cow colleges." To some extent this reflected lower admission standards and the high proportion of students who were not after a 4-year-degree course. It also reflected the fact that —agrarian mythology to the contrary—agriculture as an occupation ranked low on the totem pole until World War II.

The hard economic times of the 1930's bore heavily on the land grant colleges, experiment stations, and Extension Services. Whole faculties went unpaid or were issued State script of dubious value. Critics demanded a halt to research because agriculture was over-producing; there already was a store of new agricultural knowledge sufficient for the next half-century, they said. Extension Services were branded servants of organized, affluent farmers and not entitled to public funds.

Rising to the occasion. The crisis also was a time of opportunity. The land grant colleges played a leading part in developing and implementing the agricultural programs adopted during the Depression. Many of the programs were devised by economists and sociologists on the faculties of land grant colleges and the experiment stations.

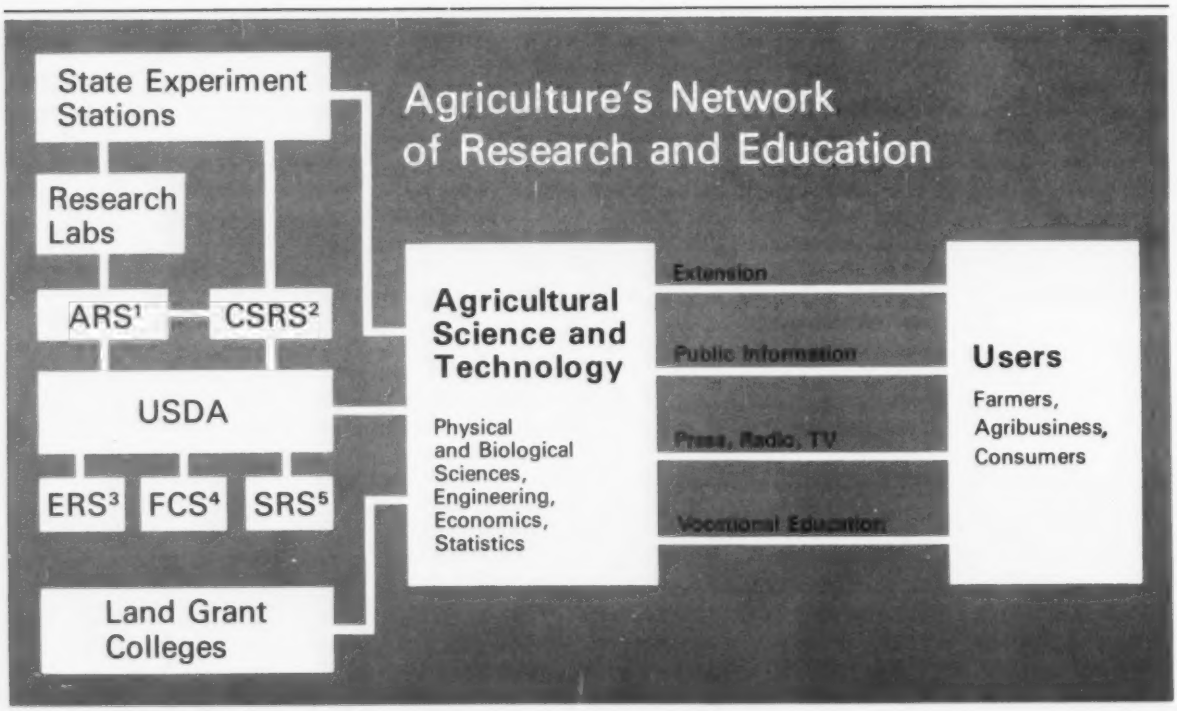
Extension was the only nationwide organization capable of carrying out the New Deal programs in short fashion. At the same time, funds received for administration of price support and production control programs saved the Extension Services of many States.

Payments to farmers under the new programs let them pay their taxes. In turn, the States were able to resume funding of services, including the land grant colleges.

New money. Agriculture received a new infusion of Federal funds through the Bankhead-Jones Act of 1935. It initially provided a $1-million increase in research funds, to be raised by annual $1-million increments to $5 million. Forty percent of these funds went to Federal research and 60 percent to State.

Instead of being apportioned equally among the States, as in the past, the new funds were apportioned on the basis of the total U.S. rural population. A second feature required the States to match the Federal grants.

The provisions recognized that States with the largest rural populations were least able to support institutions to promote agriculture, and provided the least funds for agricultural research and education.



[1]Agricultural Research Service
[2]Cooperative State Research Service
[3]Economic Research Service
[4]Farmer Cooperative Service
[5]Statistical Reporting Service

Half of the new funds authorized for Federal use financed establishment of nine regional laboratories which are administered by USDA in cooperation with the experiment stations.

Another deep well of funds for both Federal and State research was the Research and Marketing Act of 1946.

Working together. Cooperation between the State experiment stations and the USDA has been mandated by every agricultural appropriation act since 1887. Congressional committees are alert for evidences of wasteful duplication of research.

The experience of a century is that successful agricultural research and education is a long-time proposition. Although there are immediate benefits, major innovations require a long period for development. Even after a new practice is perfected, changing circumstances may postpone adoption.

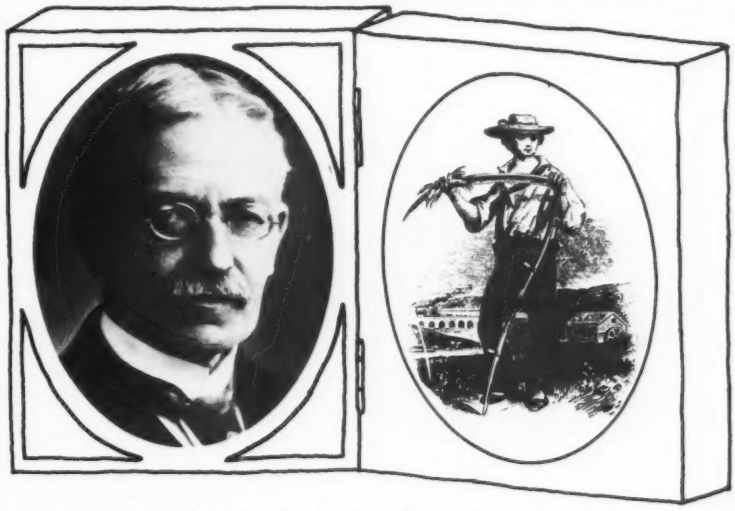
Delayed impact. For example, the breakthroughs in genetics and chemistry in the first third of this century did not begin to appear in farming until the mid-1930's. The full impact was delayed by the Depression and the outbreak of World War II. The rate of adoption did not reach flood tide until the 1950's and 1960's.

Much of the backlog of reserve technology has now been put to use. This is reason for concern because of rising costs of research, shrinking funds, and the growing complexity of the problems. The cost of maintaining one scientist for 1 year rose from $37,000 in 1966 to $56,000 in 1973. Appropriations for research were cut back in 1972-75.

However, the U.S. has large staffs of highly trained, well-equipped agricultural researchers, communicators, and educators. This is a benefit of incalculable value as we enter a period in which massive problems of environmental pollution, energy conservation, and the pressure of population on the food supply move to the forefront.

[Based on special material by Jane M. Porter, National Economic Analysis Division.]

Alfred C. True
Institution Builder



Few have played a larger role in the development of agricultural research and education than the scholarly Dr. Alfred C. True, who headed the Office of Experiment Stations in USDA from 1893 to 1915 and the States Relations Service from 1915 to 1923.

True was an extraordinary institution builder. He worked closely with individual colleges as counselor and gentle critic, and with the Association of Land Grant Colleges and Experiment Stations.

For 35 years he was bibliographer of the Association. For 32 years he served as chairman of its Committee on Methods of Teaching Agriculture. He edited the proceedings of the Association from 1893 to 1910. He was dean of the Graduate School of Agriculture, a pioneering program to provide post-graduate in-service training for agricultural scientists. The school provided a gathering place for exchange of ideas and a forum for developing standards.

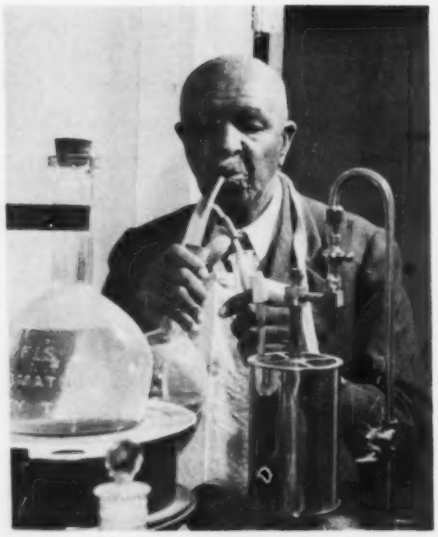
True prodded college administrators to free faculty from extension and teaching duties so they could devote more time to research. He urged more "original research" and had that term inserted in the Adams Act of 1906, which doubled Federal funds for the experiment stations.

When True died in 1929, the triumvirate of institutions for service to agriculture was firmly established. The colleges were turning out enough graduates to staff the Extension Services, the experiment stations, the vocational agricultural courses in the secondary schools, and agribusiness.

The experiment stations were contributing significantly to the growth of stable systems of agriculture in their States, and had made major breakthroughs in genetics, microbiology, organic chemistry, entomology and other fields. Extension Services had persuaded at least a million farmers there was indeed much to be gained from the practice of scientific agriculture.

From Plowshares to Computers

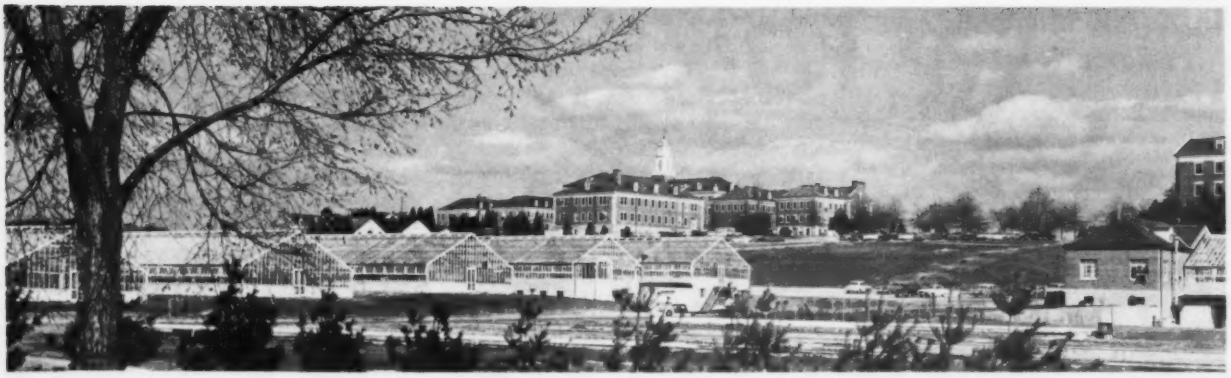
Pennsylvania State University, one of the first land grant colleges, consisted of only one building in the mid-1800's.



George Washington Carver: a pioneer in agricultural chemistry.

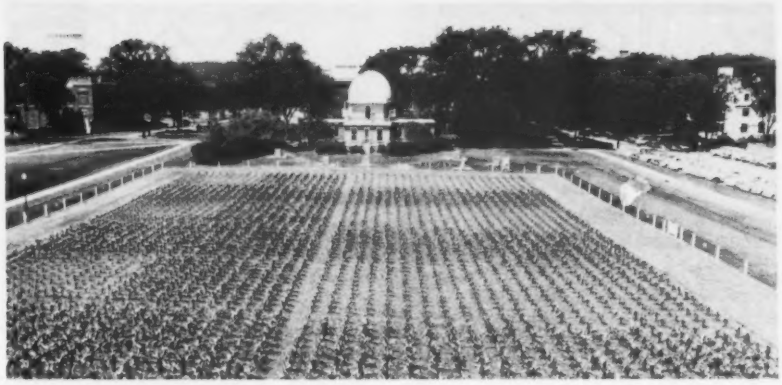
Kids have been active in 4-H Clubs since the early 1900's. Today, the Club has over 7 million members.

In a college laboratory circa 1900, students get the know-how to be passed on to the working farmer.



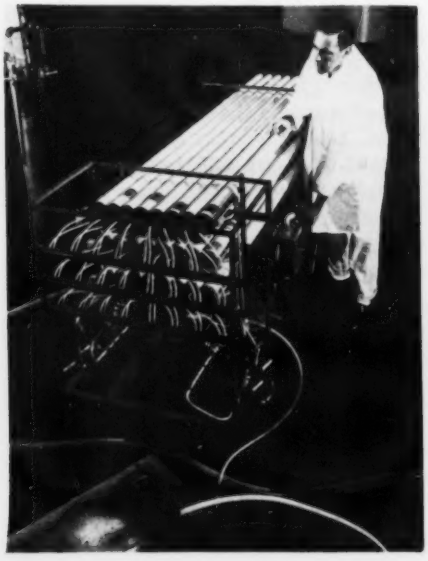
Maryland's Beltsville Center is the granddaddy of experiment stations.

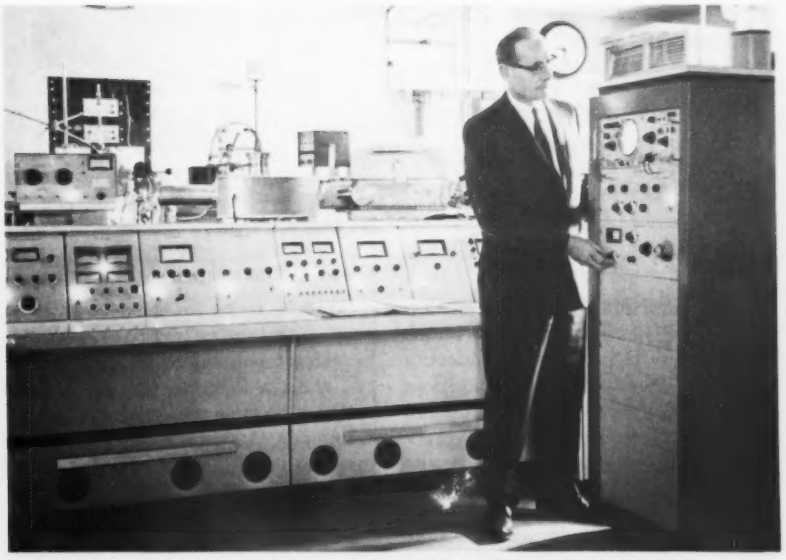
Researcher examines a flask for testing foods for salmonella bacteria.



Dating from 1876, the Morrow Plots at the University of Illinois are the oldest continuous soil experimental grounds in the U.S.

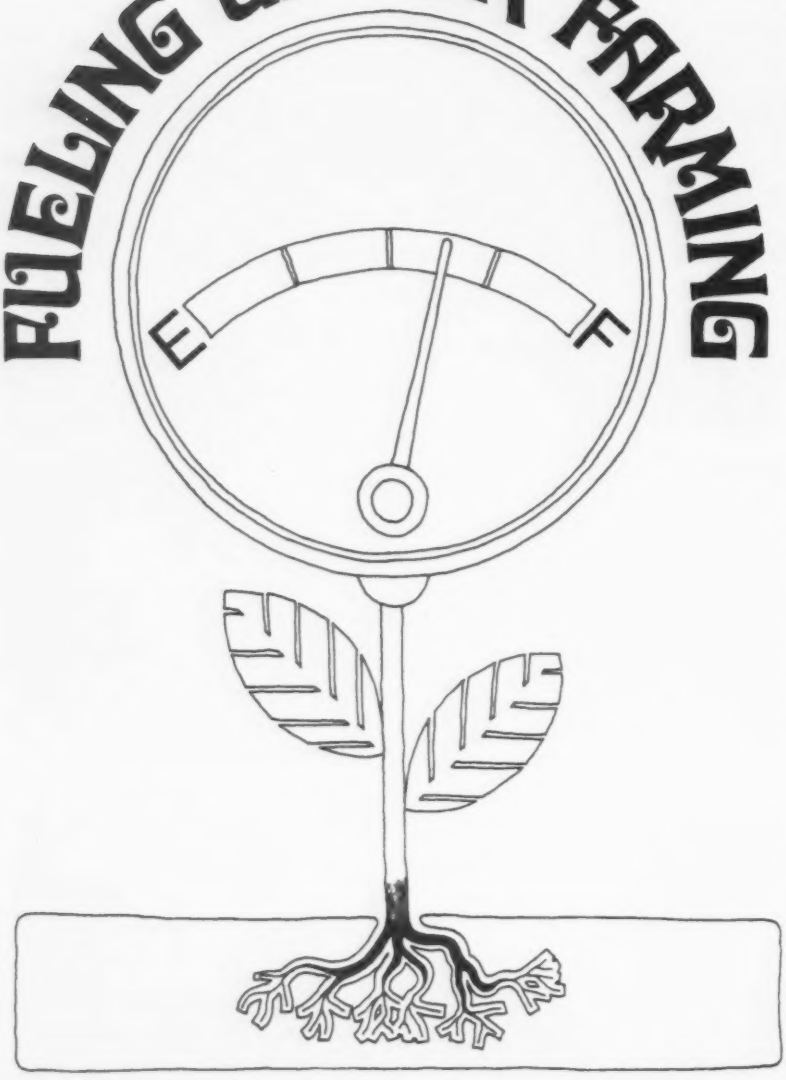
This machine converts whey—once a water pollutant—into nutritious food.





Entomologist with the Agricultural Research Service inspects modern equipment used to make chemical analyses of insects.

FUELING UP FOR FARMING



Crops need something besides sunshine and showers, and livestock need more than feed. Producing crops and livestock requires fuel.

ERS has just done a study to determine how much fuel farmers will be burning in 1985. Overall, the prognosis is encouraging. Fortunately for farmers and consumers alike, total fuel demands for farming should about hold steady over the next decade.

There's more to this story, however. Farmers as a group may not be using much more fuel in 10 years, but certain farmers will be making calls to the fuel man with increasing frequency. Livestock producers, for instance, will need an estimated 5 percent more fuel in 1985 than today. This projection assumes our after-tax incomes will grow 3 percent annually on the average, and when incomes go up, shoppers tend to buy more meat and less cereals.

Fuel requirements for crop production will drop a shade—by around 1 percent. Here again, this applies to crop farmers as a whole. Demand will vary greatly from crop to crop, and will also depend heavily on types of farming practices.

Production efficiency. Why will the average crop farmer be pumping less fuel by 1985?

Thanks to big gains expected in production per acre, U.S. farmers will have to increase the Nation's total acreage only 1 percent over the next decade to meet our needs for crop foods. The advancement in crop yields can be credited to improved seed varieties, and more efficient use of fuel and fertilizers.

In a nutshell, greater efficiency is the main reason why less fuel will be needed for crops in 1985, even though more acres will be planted. The biggest fuel-saving trend is the switch from gasoline to diesel fuel.

Three-quarters of a gallon of diesel fuel will do the work of a gallon of gas. In 1973, the more efficient diesel accounted for 28 percent of the fuels used for farming—gasoline, diesel, and LP fuels (gas, butane, and propane). In 1985, ERS estimates the share of diesel fuel will be 40 percent and climbing. This shift to diesel could result in a 4-percent reduction in overall fuel requirements if there are no other changes in patterns of fuel use.

Cutbacks in tillage. Another key to fuel efficiency is the trend toward reduced tillage practices. The rising costs of labor and fuel have prompted many farmers to till less before planting wherever possible—and that will save energy.

Various systems of reduced tillage are coming into use, from conventional to "no-till," and machines are being developed for other methods.

Reduced tillage has gone over big with corn farmers. It's estimated that the cutback in groundbreaking could drop the preharvest fuel requirement for corn from the present 8 gallons per acre to as little as 3 gallons.

Reduced tillage practices are working in cotton production too. By 1985 it will be the rule on about 40 percent of the cotton acreage in the Mississippi Delta, Appalachian, and Southeast regions, at a fuel saving of over 10 percent per acre.

Farmers in those areas plant nearly half the Nation's total cotton acreage, and produce a larger proportion than that. ERS says they could be practicing reduced tillage on as much as 60 percent of their cotton acreage not too long after 1985.

Offsetting the savings. Though the researchers found many factors that will spell lower fuel requirements in 1985, in practically every instance they turned up added demands that would offset the fuel savings.

Corn is a case in point. In theory, higher yields, the switch to diesel, and reduction in tillage should mean that less fuel will be needed for corn production over the coming years.

But it won't quite work out that way. New harvesting methods, added irrigation, and increased crop drying will cancel any savings, and probably drive the fuel demands of corn growing higher in 1985.

Recent changes in harvesting methods have generally meant higher fuel needs, and the trend is expected to continue through 1985. In the case of corn, combines will harvest over four-fifths of the crop in 1985, compared with half in 1969. The combines swallow fuel at a rate that is over a fourth of a gallon more per acre than the old corn pickers.

Fuel for irrigation. Nearly all kinds of crops grown in the U.S. receive some irrigation, especially fruits and vegetables. ERS predicts that in 1985 the share of acres that are irrigated will be slightly higher than now. This, of course, will require more fuel.

Added fuel demands for irrigation vary considerably among the crops. Irrigated acres of corn, cotton, and fruit demand 50 percent more fuel than nonirrigated acres.

For some crops the added demand runs even higher. It takes 3 times more fuel to raise sorghum on irrigated land than on nonirrigated land, and twice as much to grow alfalfa, soybeans, and wheat.

Another growing practice that will run up the fuel bill for corn and other crops is crop drying. Nearly

(Continued on page 16)

Saving Fuel and Water: New Day for Windmills

Windmills could make a strong comeback in U.S. agriculture if some people had their way.

ERS, for example, has recommended a number of ways farmers can conserve fuel and energy—and building more windmills for power to fill stock tanks is suggested for livestock producers.

Other energy ideas around the farm include saving on heating fuel by insulating animal maternity pens or broiler houses.

Good fences may make good neighbors, but they don't save fuel. ERS suggests that unnecessary fences and hedgerows be removed, so tractors and other machinery can operate on larger fields and be moved easily from field to field. Or a handy gate could be built. Research shows that larger farms are more fuel efficient—farms of less than 100 acres burn 3-4 times more fuel per acre than a 200-acre spread.

ERS isn't going so far as to recommend the hiring of water witches to locate water, but the experts are pushing "moisture sensing blocks." Instead of irrigating on a rigid time sequence, farmers could use the blocks to determine when the crops actually need water, and just how much. The process could save both water and fuel. By the same token, energy can be saved if soil testing is used to determine the exact amount of fertilizer a crop needs.

Pesticide use—and thereby petrochemical feedstock consumption—could be reduced by rotating crops and planting trap or border crops for natural control of insects and disease.

In the meantime, the biggest fuel savings can be gained by switching from gasoline to diesel-powered tractors and eliminating unnecessary tillage operations.

[Based on *The U.S. Food and Fiber Sector: Energy Use and Outlook*, prepared for the subcommittee on Agricultural Credit and Rural Electrification of the Committee on Agriculture and Forestry, U.S. Senate, Sept. 20, 1974.]

TANKING UP FOR SAVINGS

High gasoline prices have been a hard pill to swallow—especially for farmers, who need large amounts to run their equipment. Fortunately for them, there is a way of cutting corners. By purchasing large quantities in bulk, they can trim hundreds of dollars off their gas bills.

In 1974, farmers purchasing in bulk saved an average 5 cents a gallon over those purchasing from service stations. ERS estimates that if all farmers had bought gas in bulk, they could have saved $96 million.

By converting to bulk delivery, the average farmer in the Northern Plains could save $572 a year in gasoline costs. Average savings in other areas: Lake States, $210; Corn Belt, $201; Southeast, $49; and Appalachia, $48.

Savings can be substantial, but farmers need fairly large operations to take advantage of bulk buying. Small farms may not use enough gas to warrant the expense of building storage facilities. In 1974, most of the gas sold in bulk was to farmers with yearly sales of $10,000 plus.

[Based on article in *Agricultural Outlook Digest*, AOD-209, by Gwendolyn Gales, National Economic Analysis Division.]

twice the current percentages of corn, sorghum, and soybeans will be dried in 1985.

The added crop drying will swell corn's fuel demand by 35 percent per acre, sorghum's by 10 percent, and soybeans' 3 percent by 1985.

Tobacco's curing needs. Most of the fuel for crop drying goes to cure tobacco. It burns about 10 times more fuel per acre than other crops, mostly for curing. But more LP fuels, and less fuel oil, are being used for flue-curing, and the move to the more efficient LP fuels is predicted to reduce the fuel per acre requirement of tobacco 5 percent.

The amount of fuel necessary to raise an acre of any crop varies widely. It would take only about 3 gallons of fuel to raise an acre of selected pasture, or hay, other than alfalfa. Outside of high energy consuming tobacco, the most demanding crops are potatoes, which need around 50 gallons per acre.

Even with the fuel demand for an acre down to 370 gallons in 1985, tobacco will be turning more than its share of fuel into smoke. The crop will burn about 4 percent of all the fuel used in U.S. farm production, though it will require only two-tenths of 1 percent of all acres planted.

An energy treadmill. You might say that U.S. farming will be taking three steps forward, and three steps back in coping with its fuel needs. Progress toward greater fuel efficiency has been boosted by improved yields for virtually every crop, the trend toward substitution of more efficient fuels, like diesel and LP fuels for gasoline, and by cultural advances like reduced tillage.

But most savings in total fuel needs will be erased by increased demand for food, and by greater needs for irrigation and for crop drying.

[Based on "Fuel Use for Crop and Livestock Production in 1973, with Projections to 1985," paper by Austin S. Fox, National Economic Analysis Division, presented at the Southern Agricultural Economics Association meetings, New Orleans, La., February 1975.]

Greenest Pastures Are Still Close To Home For Most Elderly

When Uncle Joe turns 65, he'll likely pack his bags and head out from Iowa to Florida's sunny shores, right?

Nope, try again. Contrary to popular literature, most older Americans tend to stay put. According to 1970 Census statistics, only 7 to 8 percent of the Nation's 20 million elderly changed addresses annually from 1965–70, and most of the movers stayed within the same county. The number crossing State lines was quite low—about 3 percent per year.

True enough, Florida does have the largest proportion of senior citizens of any State—nearly 15 percent of the State's total population in 1970. Still, most of our elderly reside in such heavily populated States as New York, Pennsylvania, Ohio, Illinois, Texas, and California. These six States account for roughly 40 percent of our senior citizens.

While the majority of the elderly live in metropolitan areas, more than 7 million, or 36 percent of those 65 and over, are nonmetro residents. Their numbers may be small compared to their metro counterparts, but they generally make up a greater share of the total population in the counties where they live.

The nonmetro concentration is particularly heavy in the Midwestern and Great Plains farm belt States, and in the Southeast. Eighty percent of the counties with 15 percent or more elderly residents are located from the Dakotas south through Texas. And in the region encompassing Iowa, Missouri, Kansas, and Nebraska, the elderly account for 12 percent of the population. Seventy percent of the senior citizens in this region live in nonmetro areas.

As a result, researchers believe mid-America may be an area where it's tough for older people to obtain social and business services. As young people leave, their elders are left with a shrinking tax base to support needed services. Rising property and sales taxes place an additional economic burden on the rural elderly.

The wide open spaces of this region can also complicate the delivery of services to this group because of scarce public transportation.

[Based on preliminary findings of a project on the economic needs of elderly Americans in nonmetropolitan areas, by Donald K. Larson, Economic Development Division.]

Survey Shows 1 in 4 Families Buy Wine

American families don't indulge much in wine drinking—at home, anyway.

A survey of almost 7,000 households showed that only 1,770 purchased at least one bottle of wine during the interview month. The average purchase per buying household was a little over three-fourths of a gallon.

The survey also found out something about the typical wine-buying family. It's most likely to live in or near a big city, particularly on the East or West coasts, and have an above-average income and education. In fact, the average family income ran almost $3,000 higher for wine purchasers.

Nearly as many men as women shop for wine, 49 versus 51 percent. Other findings: most of the wine—almost 60 percent—was bought in liquor stores, whereas slightly over 30 percent came from supermarkets. Wine figured high in entertaining: friends and relatives helped the family down about half of it. And about 7 percent of the spirits were given as gifts.

[Based on "America Buys Wine" and "A Select Product With a Select Audience," articles by John L. Baritelle, Commodity Economics Division, and Raymond J. Folwell, Washington State University.]

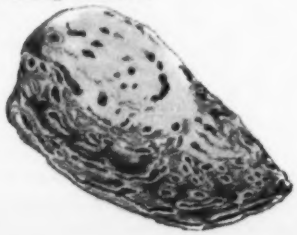
Crackdown on Nut Use Stirs Industry

Do there seem to be fewer nuts in the pecan sticky buns or almond cookies you buy nowadays? Don't blame your taste buds—there may in fact be fewer nuts.

Soaring prices of sugar, flour, and other crucial baking ingredients—not to mention the added costs to stoke the stove—forced some manufacturers of baked goods to start cutting corners last fall. And "nonessential" ingredients like nuts were often the first to go with toughening times. Even in products where nuts are essential, such as pralines and walnut cakes, some manufacturers have been skimping on the nuts, raising the price, or both.

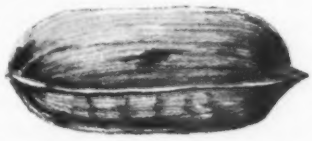
Ironically, the cutback strikes when tree nut production is burgeoning. Output of the four major nuts—pecans, walnuts, almonds, and filberts—hit a record 443,800 tons in 1973, over 1½ times the average production in 1960-64. Hawaiian macadamia nuts added another 5,500 tons.

The $408-million tree nut industry, however, isn't about to let its mainstay markets fade away. Industry people are trying to counter the sagging demand from food manufacturers by stepping up advertising and sales promotion. Their campaigns often focus on the nutritive value of nuts and tantalize the consumer by suggesting more imaginative uses of nuts in cooking and entertaining. Relatively new markets such as cereal manufacturers, mail order houses, and foreign buyers are also being courted.



The almond industry has scored the greatest success in coming up with new markets and uses. Perpetually plagued with large supplies and limited markets, the almond handlers have introduced their wares in foods such as natural cereals and frozen vegetables and casseroles. They've also drummed up considerable foreign business. Exports now account for over half the shelled almonds, compared with under 10 percent in 1962-63. And, over 95 percent of the almond crop is sold shelled.

Domestically, the top users of almonds—confectioners, salters, and cereal manufacturers—take over half the market. The rest goes to bakers, other food manufacturers, and other outlets, such as retailers, wholesalers, and mail order houses.



The pecan industry is playing promotion on a low key, reason being the wide swings in annual production and supplies. However, pecan use seems to be holding its own—replacing declining markets with new ones.

The biggest buyers of pecans—bakeries—took only 26 percent of the crop sold in 1974, down a tenth from 1961. But sales to the other markets picked up. Confectioners, the No. 2 customers, used a slightly greater percentage in 1974—almost a fourth of total sales. Gift packs and mail order sales rose significantly.

Completely new pecan outlets were exports, accounting for over 5 percent of the sales in 1974, and cereal manufacturers, about 2 percent. Church donations and sales marginally added to the list of outlets.

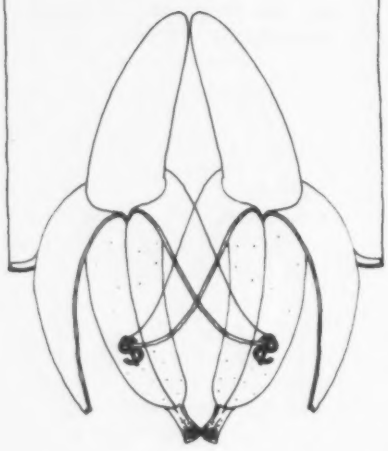
As with the almond business, the walnut industry has cultivated foreign trade. During 1963-73, exports zoomed from practically zero to account for a fifth of the in-shell walnut market.

On the domestic front, most of the in-shell walnuts continue to go to grocery wholesalers and chain stores. Traditional markets for shelled nuts, on the other hand, are down. The biggest seller—unsalted packages in grocery stores—only accounted for about a fourth of the shelled sales in 1974, down 34 percent from 1962-63.

Marketing patterns for the filbert industry have remained fairly static, but then so has production. Handlers market a fairly constant supply of in-shell filberts each year because they believe demand is fairly stable. The excess filberts are shelled. Rivalry among marketing agencies and sharp competition from imported, low-cost shelled filberts, however, have dampened interest in marketing innovations for the shelled filberts.

[Based on "Changing Marketing Patterns for Domestic Tree Nuts," by Jules V. Powell, Commodity Economics Division, in *The Fruit Situation*, TFS-194, March 1975.]

Yes, we do have Bananas



"Yes, we *do* have bananas, we *do* have bananas today."

Contrary to the song of the twenties where the street vendor had all sorts of fruits and vegetables but no bananas, the fruit is now in plentiful supply and leads the pack in per capita consumption of fresh fruits. Last year, the average U.S. banana eater peeled nearly 19 pounds, the most since 1969.

There are plenty of bananas to reach for, all right. The question is—can you afford them?

With the greater demand, the U.S. imported a record amount of the fruit from Central and South America—about 4.3 billion pounds—despite hurricane damage, particularly in Honduras, and despite the threat of a tax on bananas tacked on by major banana exporting countries.

By now, the banana crop has basically recouped from the hurricane. But the export tax is still a hot issue, and in the end, it looks as though banana lovers may have to foot the bill in the form of steeper banana prices.

Simmering since early last year, the tax controversy began when several banana-exporting countries decided to form a Banana Producers Union (BPU) to boost fruit prices. The target was a tax of 2½ cents per pound of bananas, payable by the exporter at the dock.

However, the BPU hasn't been as successful as its counterpart—the Organization of Petroleum Exporting Countries. For one thing, bananas are more expendable than oil. For another, not all of the major banana exporters have instituted the tax, and for those who have, the methods of levying it vary from country to country.

So far, only Panama, Costa Rica, and Honduras have levied the tax. Panama, which uses an escrow-fund approach for the tax, charges 35 cents on each 40-pound box of bananas. Honduras and Costa Rica directly assess the duty, charging 30 and 45 cents per box. The other major banana exporters—Ecuador and Guatemala—have not agreed to the tax.

How an export tax—if adopted by all of the big five banana producers—would sway retail prices in the U.S. remains to be seen, though the early prognosis is not good. Until mid-1974, U.S. banana prices had remained basically the same for 20 years. But in June 1974, retail prices went over the 20-cent-a-pound mark to more than 23 cents, as imports lagged and the tax issue flared. Then, after a decline, prices shot to a record 24 cents a pound in October following reports of hurricane damage to Central America's banana groves.

In spite of some weakening in retail prices during November and December, prices were picking up again early this year, partly as the result of the export tax.

Taxes or no, bananas are apparently not a food that consumers will buy at any price. As the price goes up, consumers resist by buying less.

[Based on special material from Andrew Duymovic, Commodity Economics Division, and Thomas Warden, Foreign Demand and Competition Division.]

Arkansas' Elderly Sound Off on Nursing Homes

When it comes to privacy and independence, elders are even more demanding than the young set. That's the conclusion reached by ERS researchers in a recent study on the attitudes of the elderly toward nursing homes.

Two hundred persons between the ages of 55 and 65 were questioned in two Arkansas counties—one rural, the other urban. Respondents were divided equally between men and women and reflected a wide range of income and educational levels. Race was not a significant variable because there were no minorities from the rural area and less than 5 percent from the urban area.

All said they wanted to keep their own homes for as long as possible, even in the event of bad health. None planned to retire to nursing homes, and only 27 percent preferred to go to a nursing home if they got sick.

The respondents stressed the importance of the mental and emotional needs of the elderly, as well as their physical needs. The most important services they felt nursing homes should have are kind personnel, privacy, and expert medical care. This fact has important implications to planners and nursing home administrators, suggesting that a warm social environment is essential for making nursing homes more attractive.

More than 4 in 5 studied in this survey had visited a nursing home within the past 5 years. Those who visited once or more a week were mainly concerned with the quality of the staff.

Nearly half the participants realized that all kinds of people were in nursing homes, not just the poor or those who had lost the use of their mental faculties.

Almost 70 percent felt there were many differences in the quality of care given by nursing homes, although 60 percent believed that they

were generally "good." However, over one-fourth did not consider nursing home residence as a viable option under any circumstances.

[Based on the manuscript, Attitudes Toward Nursing Homes and Other Facilities for Meeting Health Care Needs After Retirement: Scott County and Fort Smith, Arkansas, by Allan May, Jane Fitzgerald, Suki Hinman, Carolyn Stark, and Mary Jo Grinstead, Agricultural Experiment Station, University of Arkansas, and Bernal Green, Economic Development Division.]

U.S. Cows Top Others In Annual Milk Output

Americans can be proud of their cows. Of all the milk cattle in the world's major dairy-producing countries, U.S. cows are the most productive. They churn out an average of slightly over 10,000 pounds of milk each per year, according to 1973 statistics.

Only the cows of Japan's rather small dairy industry yielded more —close to 12,000 pounds.

No other country broke the 10,000 pound mark in 1973, though the Netherlands came within a couple of hundred. Scandinavian cows followed close behind in the world rankings, with Norway, Denmark, and Sweden all around the 9,000 pounds level.

New Zealand may boast of the largest herds in the world—averaging 105 head per farm versus 30 for U.S.—but its cows rank low on the milk scale. Their average yield was a bit over 6,200 pounds. Among the major producers, only Australian cows were tapped for less: an average of 5,900 pounds.

Yields per cow have proven to be closely related to the amount of concentrates the animals are fed. The American and Dutch cows are fed the most. The average U.S. dairy cow consumes over 4,000 pounds per year, and in Holland, about 2,300.

[Based on *The Impact of Dairy Imports on the U.S. Dairy Industry*. AER–278.]

Hard Times for Texas Feedlots

Cattle feeding is big business, and although it's currently in an economic slump, there's nowhere that it's bigger or brassier than in the Longhorn State itself—Texas.

Up to 100,000 head can be fed in just one of this State's commercial feedlots. The product: richly marbled and tender beef, which accounts for a good deal of the steaks and roasts sold throughout the U.S. today.

The depression in the feeding business is primarily a result of skyrocketing grain costs. Feedlots are reducing the size of their operations, and nationwide, about 25 percent fewer cattle are on grain than a year ago. Texas feedlots, which usually maintain 65 to 70 percent capacity the year round, are now down to 35 to 40 percent.

The survival of some feedlots depends on this year's feed grain crop. A bumper crop will lower prices and no doubt revitalize the feeding industry. A poor crop means more grass fed, lean beef, which some people like but others say doesn't taste as good as the rich, fat-coated cuts.

Before the feeding industry's current cost-price squeeze, ERS and Texas A&M University did some research on the cattlemen who patronize feedlots in the Texas Panhandle-Plains area, where four-fifths of the State's cattle are fed.

Using 1972 statistics, the researchers found that more than 90 percent of the cattle fed in that area were owned by custom clients, relatively large operators averaging almost 3,500 head per feedlot placement. Over 70 percent of the feedlot owners' operating capital came from feed sales and services to these customers.

As for the custom clients, the majority are associated with agriculture. In 1972 about 43 percent were farmers, ranchers, and livestock dealers. Another 30 percent were professional custom feeders, and the remainder were feed companies, meat packers, retailers, bankers and others. Even though most were connected with agriculture, only a fourth maintained their own cow-calf operations.

Although many people thought these operators were in business primarily to take advantage of temporary market situations and tax loopholes, this proved not to be the case. The study showed that 90 percent maintained a continuous or regular placement program in 1972, with more than 55 percent placing cattle on at least a monthly basis. In addition, 73 percent said they would continue normal placement even during periods of unfavorable margins.

Many of the custom feeding clients (48 percent) let special dealers and order buyers purchase their cattle. Another 39 percent bought their own. Practically all specified the grade, weight, sex, and type of cattle they wanted. Although two-thirds chose selling dates for their fed cattle, most clients consulted feedlot personnel before making a decision.

Clients considered reputation and grain costs to be the most important reasons for selecting a particular feedlot.

Although the picture has changed since 1972, the commercial feeding business is still kingpin of Texas' huge cattle industry. ERS economists predict that when feed grain prices go down, Panhandle-Plains cattle feeders will return to the feedlots and fed beef will once again edge out the rangier cuts now appearing on many dinner tables.

[Based on *Custom Feeding Clients Using Texas Feedlots—Operational Characteristics, Management Practices, and Feeding Strategies*, by R. A. Dietrich, Texas Agricultural Experiment Station and Texas A&M University; J. Rod Martin, National Economic Analysis Division; and P. W. Ljungdahl, Texas A&M, B–1148.]

Low-Cost Meal Found High In Nutrition

Anyone with a grain of sense knows a bowl of beans is less nutritious than a choice steak with all the trimmings. Right? Sounds logical, but an ERS economist found that it's not true.

After preparing several dinner menus, based on what people of different economic and social backgrounds typically eat, the economist found that the nutrition level for all menus was about the same.

More important, she found that the cheapest menu went easy on the family food budget. For a family of four, the "low-cost" fare saved more than $1.50 over the "standard" menu and almost $10 over the "expensive standard."

The "standard" dinner cost approximately $3.80. Each serving consisted of ½ cup tomato juice, saltines, 3 ounces ground beef, catsup, ½ cup mashed potatoes (made from scratch with margarine and milk), ½ cup canned green beans, tossed salad of lettuce and radishes plus a dollop of French dressing, bread and margarine, slice of homemade apple pie, instant coffee, and a half milk, half cream creamer.

The costliest menu—"expensive standard"—put a big dent in the pocketbook at $11.80 for four people. A higher priced cut of meat plus an extensive use of ready-prepared food jacked up the cost.

Servings included ready-to-serve shrimp cocktail, ½ pound ribeye steak, baked potato and sour cream (frozen, ready-to-heat), frozen peas with butter sauce, tossed salad of lettuce, green pepper, tomato, and radishes with purchased blue cheese dressing, brand name sesame seed rolls, butter, slice of purchased brand name apple pie, brewed coffee, and table cream.

The final menu—"low-cost"—could be served in a family of four receiving $5.12 a day in food stamps. Total cost came to $2.20. Each person received a portion of beans (1¼ cup of pea, navy, or great northern cooked with ham hock), cole slaw, 2 pieces of homemade cornbread, margarine, ½ cup canned applesauce, 2 purchased oatmeal cookies, instant coffee, and milk.

Each menu had about 1,000 calories and similar amounts of vitamins and minerals. Standard and low-cost dinners had average amounts of protein—about half a day's requirement—while the expensive standard dinner had more than a day's requirement. The low-cost meal was lower in saturated fat because it contained very little meat. On the whole, the nutrition level was about the same for each menu.

The results of this research show that meals can be inexpensive and still be good for you, and that packaged, ready-to-serve items can spell headaches at the checkout counter.

[Based on special material by Corinne LeBovit, National Economic Analysis Division.]

Land Values Outpace Farm Tax Hikes

Do farm real estate taxes seem to be on a galloping increase? Yes and no.

For the U.S. as a whole, taxes per acre in 1973 were up 46 percent over 1967, averaging $2.56 in 1973.

On the other side of the coin, farmers' land holdings were worth more than in 1973 than 5 years earlier, so taxes actually averaged less per $100 of full property value in 1973 than in 1967—96 cents versus 98. Only in Florida and Rhode Island did taxes outpace market value of farm real estate.

Taxes per acre in Michigan and Rhode Island nearly doubled during 1967-73, for the fastest growth rates in the Nation. Massachusetts and Virginia came in next, with increases of over 80 percent. Taxes in Vermont were up 76 percent.

But taxes per $100 of full value rose less than 10 percent in three of those five States, and actually fell 18 percent in Vermont. Only Michigan showed a large increase. Taxes per $100 of full value in Michigan in 1973 were 24 percent higher than in 1967.

On the other hand, taxes per acre in Oregon changed little during 1967-73. In Delaware and Alaska, taxes crept up less than 1 percent at the end of the period, although they had been higher in the interim.

Louisiana farmers saw only a 5-percent jump, but as with Delaware and Alaska, taxes had been higher—in 1970, they were up 15 percent.

In some instances, the tax decreases were due to differential assessment laws which give the farmer a break. Declining public school enrollments, increased State aid for education, and Federal revenue sharing also played a role in mitigating the local property tax in some cases.

In actual dollars of taxes paid per acre in 1973, Rhode Island topped the list at $19.73 per acre on the average. Close runners-up were New Jersey at $17.17 per acre, Massachusetts $16.50, and Connecticut $15.21. New Mexico farmers paid the least—only 27 cents.

Massachusetts had the highest property tax per $100 of full value in 1973—$2.06. Rhode Island was next with $1.90, followed by California ($1.88) and New York at $1.71. State and local governments in Alabama, on the other hand, levied only $.18, on the average. Delaware ($.26) and Louisiana ($.28) had the next lowest rates.

Farm real estate taxes totaled almost $2½ billion in 1973. This figure compares with a little over $1.7 billion in 1967, and continues a trend of rising farm real estate taxes since 1942.

[Based on *Revised Estimates of Taxes Levied on Farm Real Property, 1960-73*, Statis. Bul. 538, and *Farm Real Estate Taxes: Recent Trends and Developments*, RET-14, by Jerome M. Stam and Eleanor L. Courtney, Economic Development Division.]

Recent Publications

Consumer Satisfaction With Food Products and Marketing Services. Charles R. Handy, National Economic Analysis Division, and Martin Pfaff, University of Augsburg, West Germany. AER–281.

Through a nationwide survey, this study measures consumer opinions concerning their satisfaction or dissatisfaction with food products, how these are sold in stores, and how well the food industry meets the consumer's demands. Questionnaires were completed by 1,831 households, or 72 percent of the eligible number in the sample. Generally, respondents expressed a high overall level of satisfaction with food products and foodstores. Price stood out as the most obvious source of displeasure, but varying degrees of dissatisfaction were also expressed over availability and reliability of product and shopping information.

The Agricultural Situation in Western Europe: Review of 1974 and Outlook for 1975. Foreign Demand and Competition Division. FAER–100.

According to this report, 1974 was a good year for agricultural output in Western Europe. And if the weather is favorable, production of most major commodities will increase again in 1975. Highlights of 1974 include: (1) Record grain production, led by larger wheat output; (2) increased output of nearly all livestock products; (3) a large increase in target and support prices in the European Community; and (4) record U.S. agricultural exports to the region of $7 billion.

Economics of Agriculture: Reports and Publications Issued or Sponsored by USDA's Economic Research Service, July 1973-June 1974. Economic Research Service. Supp. No. 6 to ERS-368.

This bibliography lists the ERS publications during the last fiscal year. The publications are grouped by subject-matter areas and by ERS divisions responsible for the research.

Single copies of the publications listed here are available free from The Farm Index, Economic Research Service, Rm. 1664–So., U.S. Department of Agriculture, Washington, D.C. 20250. However, publications indicated by (*) may be obtained only by writing to the experiment station or university. For addresses, see July and December issues of The Farm Index.

New Directions in Swedish Agricultural Policy. Marshall H. Cohen, Foreign Demand and Competition Division, FAER-104.

This report detailed recent Swedish agricultural policy developments such as: (1) selective consumer subsidies to hold down food prices, (2) incentives for expanding agricultural production and (3) new indexes for determining farm prices. Protective levies on imports, particularly grains and livestock products, are still in effect. U.S. agricultural exports to Sweden, valued at $81.5 million in 1973, are not likely to be directly affected.

Marketing Practices of Growers of Flowers and Plants: Philadelphia, Baltimore, and Washington, D.C. Richard Hall and Stephen Raleigh, Commodity Economics Division. ERS-593.

According to this study, flower growers within 50 miles of three terminal wholesale flower markets—Philadelphia, Baltimore, and Washington, D.C.—expanded production during 1966-71, but not as fast as the national market expanded. Also, market competition led to increased production of bedding plants and other ornamentals relative to major cut flower production. Although economic pressures have not as yet made any radical changes in the growers' marketing practices, the trend toward fewer and larger firms, corporate organization, less consignment in marketing, and more direct sales to retailers will continue. The findings are based on interviews with 105 growers in the three areas.

Effect of the Small Watershed Program on Major Uses of Land: Examination of 60 Projects in the Southeast, Mississippi Delta, and Missouri Tributaries Regions. Dudley Mattson, Natural Resource Economics Division. AER–279.

Through an analysis of aerial photographs, this study surveys 1955–70 land use changes brought about through the P.L. 566 Small Watershed Program. Changes in cropland use were noted for the Southeast and Mississippi Delta regions. For both regions, cropland retirement was observable on upland portions of the watersheds, but only the Mississippi region showed increased cropland expansion on protected bottomlands of installed projects. Cropland use in the Missouri River Tributaries region was not significantly affected by watershed development. However, there was a widespread increase in soil conservation practices in this region.

The Agricultural Situation in the Soviet Union: Review of 1974 and Outlook for 1975. Foreign Demand and Competition Division. FAER–101.

Weather was the culprit last year in the Soviet Union, according to this ERS study. Crop damage lowered output about a tenth from the 1973 record. But boosted livestock production helped offset the crop shortfalls. Whether or not the Soviets will meet their 1975 production goals will again depend mainly on the weather, with better than average needed.

Decisionmaking in the Oilseed Processing Industry. Harry O. Doty, Jr., Commodity Economics Division. ERS-598.

This publication is based on a speech delivered at the 21st Annual Conference of Cooperative Soybean and Cottonseed Mills in Las Vegas earlier this year. Besides giving some vital statistics of the oilseed crushing industry, it reviews some possible changes in store for processors, and outlines the oil crops research program.

Vacant Housing: Is It Adequate and in the Right Places? Ronald Bird, Economic Development Division. Stat. Bull. No. 536.

An analysis of the First Count Summary Tapes of the 1970 Census of Housing indicates that there are few adequate vacant units located in counties having the worst housing in both metropolitan and nonmetropolitan counties in the U.E. Even in counties having the best housing conditions, vacancy rates needed for mobility and choice would leave few counties with more adequate vacant units than occupied substandard ones. There were about 174,000 vacant units available in nonmetro counties and about 493,000 in metro counties. These numbers represent about 7.3 percent of the occupied inadequate units in nonmetro counties and 31 percent in metro counties.

The Agricultural Situation in the Western Hemisphere: Review of 1974 and Outlook for 1975. Foreign Demand and Competition Division. FAER–103.

Western Hemisphere agricultural output for 1974 rose nearly 3.5 percent above the 1973 receord, but performance was mixed, according to this report. Canada's production declined 7 percent, while South America's increased 8 percent. Output in the Caribbean, Central America, and Mexico remained about the same. U.S. agricultural exports to Hemisphere countries hit a new record in 1974—$3.8 billion—and U.S. imports from the countries rose to a record $4.6 billion. Hemisphere trade for 1975 may decline, however, due to an apparent weakening of demand for many commodities.

Effects of the Proposed Northeast-Midwest Rail Reorganization on Rural Areas. Prepared by the Economic Research Service for the Economic Research Service for the Committee on Agriculture and Forestry, U.S. Senate.

The possible impacts of rail service reorganization in the Midwest-Northeast region are evaluated by this study. Established firms using rail service at 100 rural rail stations would be affected somewhat differently by rail abandonments. Feed and fertilizer dealers in the Northeast and fertilizer dealers in the Midwest are likely to suffer either financial loss or a reduction of growth potential. On the other hand, grain dealers in many parts of the Midwest will not suffer significantly because of their use of truck-rail and truck-barge transportation. Farmers and consumers are not likely to suffer overall adverse effects, although some farmers may alter enterprise combinations.

Developments in Marketing Spreads for Agricultural Products in 1974. National Economic Analysis Division. AER-261.

According to this report, increasing charges for processing and distributing food products accounted for most of the rise in retail food prices last year. These food marketing charges, as measured by the spread between the retail cost and farm value of a market basket of farm foods, rose 20 percent in 1974, three times greater than any previous annual rise. Returns to farmers for commodities equivalent to market basket foods averaged only 6 percent higher than in 1973. The retail cost of the market basket rose 14 percent. Estimates of cost and profit components of margins for 22 foods reveal that labor and packaging account for the largest share of the processing and retailing margins.

The Agricultural Situation in Eastern Europe: Review of 1974 and Outlook for 1975. Foreign Demand and Competition Division. FAER–102.

Agricultural production is up in all countries of Eastern Europe except Bulgaria and Romania, and U.S. agricultural exports to the region are forecast to level off in 1974/75. At least that's the conclusion of this ERS report. Further details: (1) grain production in 1974 hit a record for the third year in a row; (2) output of livestock products increased; and (3) unfavorable weather reduced the harvest of sunflowerseed, vegetables, fruit, and tobacco.

Interstate Custom Combining in the Great Plains in 1971. William F. Lagrone, Commodity Economics Division, and Earle E. Gavett, National Economic Analysis Division. ERS-563.

This report, the first part of a two-phase study, surveys the nature and extent of custom combining in the Great Plains in 1971. Results showed that custom operators harvested about 35 percent of the wheat acreage; interstate crews about 89 percent, intrastate crews over 7 percent, and Canadian crews less than 4 percent. Interstate custom combine crews numbered 3,341. Crew sizes ranged from 1 to 12 combines, with two-machine crews the most common. Labor on the crews totaled 16,414 workers.

Water Resources for Agriculture: Will the Well Run Dry? (AIB-384); Farmland Resources for the Future (AIB-385); and Farmland: Will There Be Enough? (ERS-584). Natural Resource Economics Division.

According to this publications package, U.S. land and water resources available for food and fiber production are adequate to satisfy domestic and foreign demand, at least until the year 2000. However, as one pamphlet notes, forces other than agriculture will be competing for the land. The leaflets are based on a recent research report—*Our Land and Water Resources, Current and Prospective Supplies and Uses* (MP-1290).

American Indians in Transition. Helen W. Johnson, Economic Development Division. AER-283.

Focusing on the Indian population during the sixties, this study indicates that the American Indian is in a period of change—economically, socially, and culturally. The population is younger, growing, becoming more urban, and moving toward self-determination. However, although there were some improvements in income, housing, and education from 1960-70, Indians are still the most disadvantaged of the minority ethnic groups in the U.S.

Economic Trends

Item	Unit or Base Period	1967	1974 Year	1974 Feb.	1974 Dec.	1975 Jan.	1975 Feb.
Prices:							
Prices received by farmers	1967=100	—	183	202	177	174	168
Crops	1967=100	—	212	220	212	204	192
Livestock and products	1967=100	—	163	190	153	153	151
Prices paid, interest, taxes and wage rates	1967=100	—	169	161	180	180	180
Family living items	1967=100	—	161	153	173	173	175
Production items	1967=100	—	172	162	184	182	180
Ratio [1]	1967=100	—	109	125	98	97	93
Wholesale prices, all commodities	1967=100	—	160.1	149.5	171.5	171.8	171.3
Industrial commodities	1967=100	—	153.8	138.2	166.1	167.5	168.4
Farm products	1967=100	—	187.7	205.6	183.7	179.7	174.6
Processed foods and feeds	1967=100	—	170.9	164.7	188.2	186.4	182.6
Consumer price index, all items	1967=100	—	147.7	141.5	155.4	156.1	157.2
Food	1967=100	—	161.7	157.6	169.7	170.9	171.6
Farm Food Market Basket: [2]							
Retail cost	1967=100	—	161.9	160.3	167.8	168.7	169.3
Farm value	1967=100	—	177.6	191.6	177.2	172.8	172.8
Farm-retail spread	1967=100	—	152.0	140.5	161.9	166.0	167.1
Farmers' share of retail cost	Percent	—	43	46	41	40	40
Farm Income: [3]							
Volume of farm marketings	1967=100	—	115	92	129	126	92
Cash receipts from farm marketings	Million dollars	42,817	95,004	6,964	8,554	8,256	5,500
Crops	Million dollars	18,434	52,677	3,310	5,365	4,785	2,400
Livestock and products	Million dollars	24,383	42,327	3,654	3,189	3,471	3,100
Realized gross income [4]	Billion dollars	49.9	97.0	—	102.5	—	—
Farm production expenses [4]	Billion dollars	38.3	64.7	—	76.1	—	—
Realized net income [4]	Billion dollars	11.6	32.2	—	26.4	—	—
Agricultural Trade:							
Agricultural exports	Million dollars	—	17,680	1,910	2,120	2,459	1,920
Agricultural imports	Million dollars	—	21,994	819	966	811	694
Land Values:							
Average value per acre	Dollars	[6]168	[7]310	—	—	—	[8]339
Total value of farm real estate	Billion dollars	[6]181.9	[7]324.2	—	—	—	[8]355.0
Gross National Product: [4]	Billion dollars	793.9	1,397.4	—	1,430.9	—	—
Consumption	Billion dollars	492.1	876.7	—	895.8	—	—
Investment	Billion dollars	116.6	209.4	—	209.4	—	—
Government expenditures	Billion dollars	180.1	309.2	—	323.8	—	—
Net exports	Billion dollars	5.2	2.1	—	1.9	—	—
Income and Spending: [5]							
Personal income, annual rate	Billion dollars	629.3	1,150.5	1,113.4	1,191.0	1,191.1	1,193.4
Total retail sales, monthly rate	Million dollars	26,151	44,815	43,134	44,821	45,955	46,830
Retail sales of food group, monthly rate	Million dollars	5,759	9,980	9,634	10,330	10,672	10,671
Employment and Wages: [9]							
Total civilian employment	Millions	74.4	[9]85.9	[9]85.9	[9]85.2	[9]84.6	[9]84.0
Agricultural	Millions	3.8	[9]3.5	[9]3.8	[9]3.3	[9]3.4	[9]3.3
Rate of unemployment	Percent	3.8	5.6	5.2	7.2	8.2	8.2
Workweek in manufacturing	Hours	40.6	40.0	40.4	39.4	39.2	38.8
Hourly earnings in manufacturing, unadjusted	Dollars	2.83	4.40	4.22	4.65	4.65	4.67
Industrial Production: [5]	1967=100	—	125	125	117	114	111
Manufacturers' Shipments and Inventories: [5]							
Total shipments, monthly rate	Million dollars	46,449	81,723	76,978	79,487	79,124	78,875
Total inventories, book value end of month	Million dollars	84,655	150,404	124,831	150,404	151,624	151,993
Total new orders, monthly rate	Million dollars	46,763	83,297	79,127	76,454	74,958	76,139

[1] Ratio of index of prices received by farmers to index of prices paid, interest, taxes, and farm wage rates. [2] Average annual quantities of farm food products purchased by urban wage earner and clerical worker households (including those of single workers living alone) in 1959-61—estimated monthly. [3] Annual and quarterly data are on 50-State basis. [4] Annual rates seasonally adjusted fourth quarter. [5] Seasonally adjusted. [6] As of March 1, 1967. [7] As of March 1, 1974. [8] As of Nov. 1, 1974. [9] Beginning January 1972 data not strictly comparable with prior data because of adjustment to 1970 Census data.

Sources: U.S. Dept. of Agriculture (Farm Income Situation, Marketing and Transportation Situation, Agricultural Prices, Foreign Agricultural Trade and Farm Real Estate Market Developments); U.S. Dept. of Commerce (Current Industrial Reports, Business News Reports, Monthly Retail Trade Report and Survey of Current Business); and U.S. Dept. of Labor (The Labor Force and Wholesale Price Index).

UNITED STATES GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS, WASHINGTON, D.C. 20402
OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE
& FEES PAID
U.S. DEPT.
OF
AGRICULTURE
AGR 101

To stop mailing ☐ or to change your address ☐ send this sheet with new address to The Farm Index, ERS, U.S. Department of Agriculture, Rm. 1664, Washington, D.C. 20250.

FI XEROX300XB R 1
XEROX UNIV MICROFILMS
SERIALS DEPT
300 N ZEEB RD
ANN ARBOR MI 48106

☆ U.S. Government Printing Office 1975: 582-235/9